

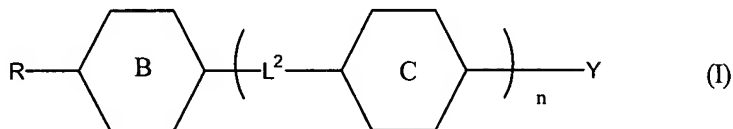
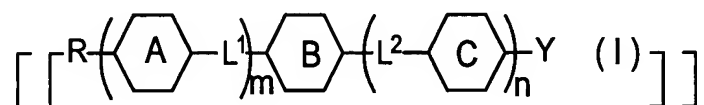
U.S. Patent Application Serial No. 10/030,185
Amendment filed October 19, 2004
Reply to AA dated September 1, 2004 and
FOA dated May 19, 2004

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

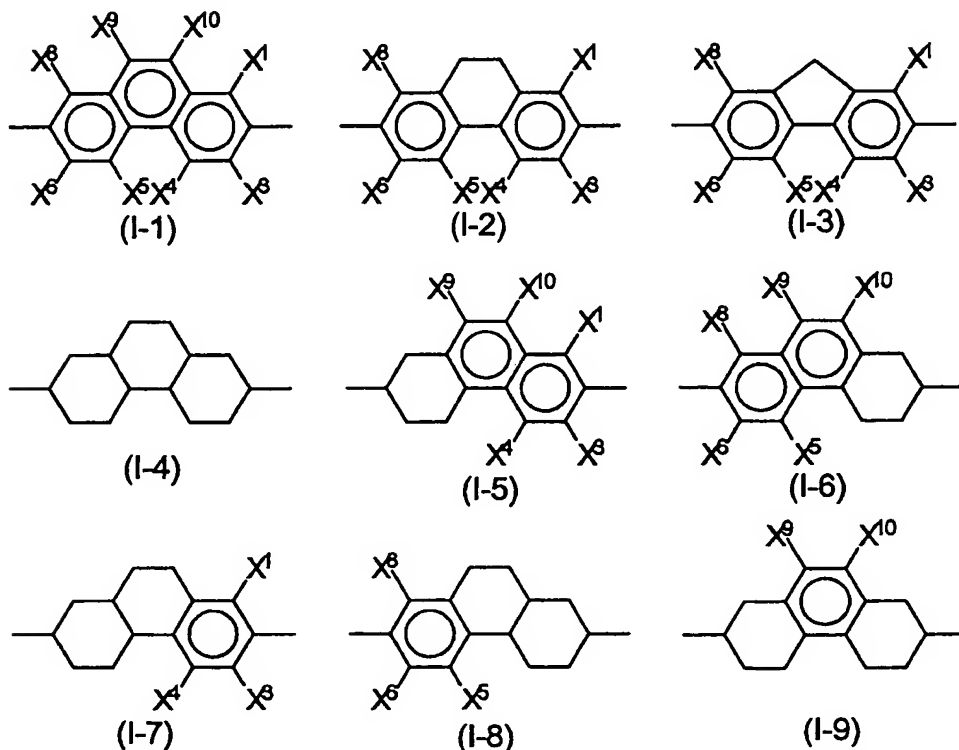
Listing of Claims:

Claim 1 (currently amended): A fused ring compound represented by a general formula (I)



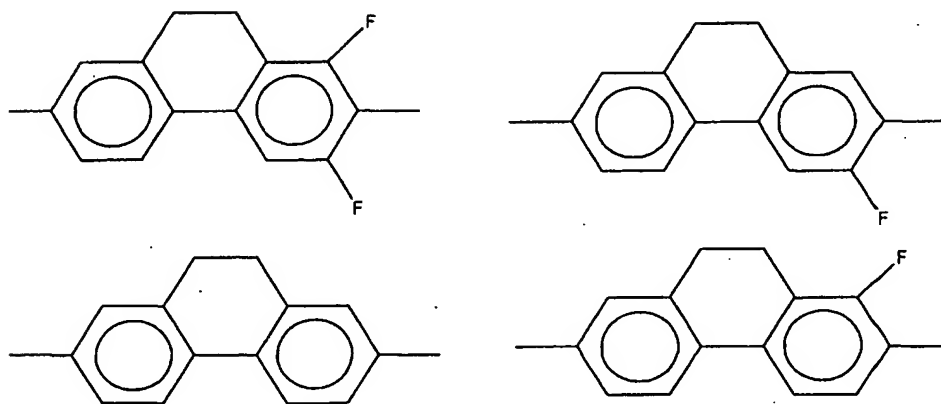
(wherein, R represents an alkyl group or alkoxy group of 1 to 16 carbon atoms, an alkenyl group of 2 to 16 carbon atoms, an alkenyloxy group of 3 to 16 carbon atoms, or an alkyl group of 1 to 12 carbon atoms substituted with an alkoxy group of 1 to 10 carbon atoms, and said groups may be substituted with a halogen, and in cases in which an asymmetric carbon arises due to substitution or branching, may be either one of optically active and a racemic mixture; ~~ring A and ring C each represent, independently, represents~~ any one of a trans-1,4-cyclohexylene group in which one CH₂ structure within said group or two or more non-adjacent CH₂ structures within said group may be

replaced with -O- and/or -S-, a 1,4-phenylene group in which one CH structure within said group or two or more non-adjacent CH structures within said group may be replaced with -N=, a 1,4-cyclohexenylene group, a 1,4-bicyclo(2.2.2)octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a trans-decahydronaphthalene-trans-2,6-diyl group, and a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, and said groups may be substituted with either one of a cyano group and a halogen; ring B represents any one of general formulas (I-1) to (I-9)

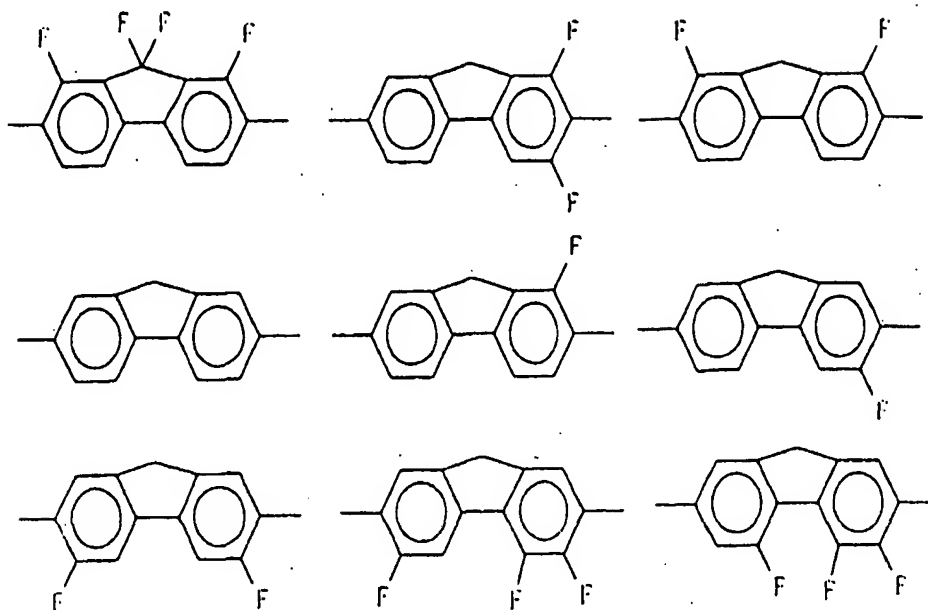


(wherein, X^1 , X^3 , X^4 , X^5 , X^6 , X^8 , X^9 and X^{10} each represent, independently, any one of a hydrogen atom, a chlorine atom and a fluorine atom, provided that conditions described below are satisfied:

- a. in (I-1), in a case in which at least one of X^3 , X^4 , X^5 and X^6 represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^1 , X^8 , X^9 and X^{10} represents either one of a chlorine atom and a fluorine atom,
- b. in (I-1), in a case in which at least one of X^1 , X^8 , X^9 and X^{10} represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^3 , X^4 , X^5 and X^6 represents either one of a chlorine atom and a fluorine atom,
- c. in (I-4) to (I-9), hydrogen atoms within a ring may be replaced with a cyano group or a halogen);
- d. in (I-2), ring B represents any one of general formulas as follows:



and in (I-3), ring B represents any one of general formulas as follows:



[[L^1 and]] L^2 ~~each represent, independently,~~ represents any one of $-\text{CH}_2\text{CH}_2-$, $-\text{C}\equiv\text{C}-$, $-(\text{CH}_2)_4-$, $-\text{CF}=\text{CF}-$, $-\text{OCH}_2-$, $-\text{CH}_2\text{O}-$, $-\text{OCF}_2-$, $-\text{CF}_2\text{O}-$, $-\text{CO}_2-$, $-\text{OCO}-$, $-\text{CH}=\text{N}-\text{N}=\text{CH}-$, $-\text{CH}=\text{CH}-\text{CH}_2-\text{CH}_2-$, $-\text{CH}_2-\text{CH}_2-\text{CH}=\text{CH}-$ and a single bond; m ~~represents 0;~~ and $n=1$ or $m=1$ and $n=0$ or $m=0$ and $n=0$ and n ~~represents 0 or 1~~ n represents 0 or 1, then at least one of L^1 and L^2 , when present, represents a single bond; Y represents any one of a hydrogen atom, a fluorine atom, a chlorine atom, a trifluoromethoxy group, a difluoromethoxy group, a trifluoromethyl group, a 3,3,3-trifluoroethoxy group, a cyano group, a straight chain alkyl group of 1 to 16 carbon atoms, a straight chain alkenyl group of 2 to 16 carbon atoms, a straight chain alkyloxy group of 1 to 12 carbon atoms, and a straight

U.S. Patent Application Serial No. 10/030,185

Amendment filed October 19, 2004

Reply to AA dated September 1, 2004 and

FOA dated May 19, 2004

chain alkenyloxy group of 2 to 16 carbon atoms, provided that cases described below are excluded:

- i. a case in which ring B represents (I-2), ~~[[m and]] n represent~~ represents 0, R represents an alkyl group and Y represents an alkyl group,
- ii. a case in which ring B represents (I-3), ~~[[m and]] n represent~~ represents 0, R represents an alkyl group and Y represents an alkoxy group,
- iii. a case in which ring B represents (I-4), ~~[[m and]] n represent~~ represents 0, R represents an alkyl group and Y represents either one of an alkyl group and a cyano group,
- iv. a case in which ring B represents (I-8), ~~[[m and]] n represent~~ represents 0, R represents an alkyl group and Y represents an alkyl group,
- v. a case in which ring B represents (I-4), ~~m represents 0 and~~ n represents 1, ring C represents a 1,4-phenylene group, L^2 represents $-CO_2-$, R represents an alkyl group and Y represents any one of an alkyl group, an alkoxy group and a cyano group,
- vi. a case in which ring B represents (I-4), ~~m represents 0 and~~ n represents 1, ring C represents a 1,4-phenylene group, L^2 represents $-OCO-$, R represents an alkyl group and Y represents an alkoxy group,
- vii. a case in which ring B represents (I-2), ~~m represents 0 and~~ n represents 1, ring C represents a 1,4-cyclohexylene group, L^2 represents $-CO_2-$, R represents an alkyl group and Y represents an alkyl group,
- viii. a case in which ring B represents (I-1), and X^9 and X^{10} represent fluorine atoms, and
- ix. a case in which ring B represents (I-3), and X^3 , X^4 , X^5 and X^6 simultaneously represent fluorine

U.S. Patent Application Serial No. **10/030,185**

Amendment filed October 19, 2004

Reply to AA dated September 1, 2004 and

FOA dated May 19, 2004

atoms, and applying similarly to compounds equivalent to those above described using combinations of abbreviations).

Claim 2 (currently amended): A compound according to claim 1, wherein ~~ring A and ring C each represent, independently,~~ represents a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with at least one fluorine atom.

Claim 3 (currently amended): A compound according to claim 1, wherein $[[L^1 \text{ and}]] L^2$ ~~each represent, independently,~~ represents any one of -OCO-, -CO₂-, -CH₂CH₂- and a single bond.

Claim 4 (canceled).

Claim 5 (currently amended): A compound according to claim 1, wherein $[[L^1 \text{ and}]] L^2$ ~~each represent~~ represents a single bond.

Claim 6 (currently amended): A compound according to claim 1, wherein ring B represents (I-3) or (I-4) ~~which may be substituted with a halogen.~~

Claims 7-8 (canceled).

U.S. Patent Application Serial No. 10/030,185
Amendment filed October 19, 2004
Reply to AA dated September 1, 2004 and
FOA dated May 19, 2004

Claim 9 (currently amended): A compound according to claim 1, wherein ~~ring A and ring C each represent, independently, represents~~ a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with ~~[[a]]~~ at least one fluorine atom, and ring B represents any one of (I-1), (I-2), (I-3) and (I-4) ~~which may be substituted with a halogen.~~

Claim 10 (currently amended): A compound according to claim 1, wherein ~~ring A and ring C each represent, independently, represents~~ a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with ~~[[a]]~~ at least one fluorine atom, ring B represents any one of (I-1), (I-2), (I-3) and (I-4) ~~which may be substituted with a halogen,~~ and ~~[[L¹ and]] L² each represent~~ represents a single bond.

Claim 11 (currently amended): A compound according to claim 1, wherein ~~ring A and ring C each represent, independently, represents~~ a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with ~~[[a]]~~ at least one fluorine atom, ring B represents any one of (I-1), (I-2), (I-3) and (I-4) ~~which may be substituted with a halogen, m represents 0 and n represents 1, and~~ L² represents a single bond.

Claim 12 (canceled).

U.S. Patent Application Serial No. **10/030,185**
Amendment filed October 19, 2004
Reply to AA dated September 1, 2004 and
FOA dated May 19, 2004

Claim 13 (previously presented): A compound according to claim 1, wherein R represents either one of a straight chain alkyl group of 1 to 12 carbon atoms and a straight chain alkenyl group of 2 to 12 carbon atoms, and Y represents any one of a fluorine atom, a chlorine atom, a trifluoromethoxy group, a trifluoromethyl group, a difluoromethoxy group, a 3,3,3-trifluoroethoxy group and a cyano group.

Claim 14 (original): A liquid crystal composition incorporating at least one compound according to any one of claims 1 through 13.

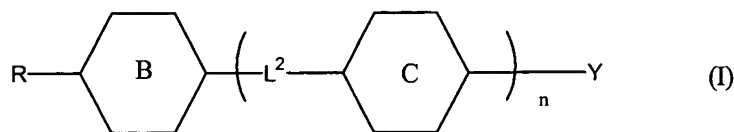
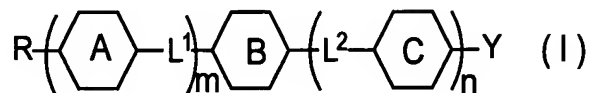
Claim 15 (original): A liquid crystal display element utilizing a liquid crystal composition according to claim 14.

Claim 16 (original): An active matrix driven liquid crystal display element utilizing a liquid crystal composition according to claim 14.

Claim 17 (original): A supertwisted nematic liquid crystal display element utilizing a liquid crystal composition according to claim 14.

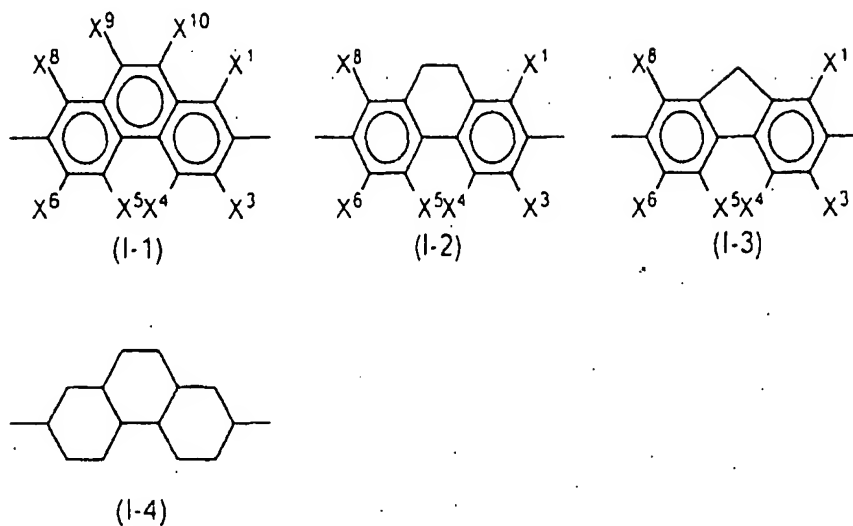
Claim 18 (currently amended): A fused ring compound represented by a general formula

(I)



(wherein, R represents an alkyl group or an alkyl group of 1 to 12 carbon atoms substituted with an alkoxyl group of 1 to 10 carbon atoms, and said groups may be substituted with a halogen, and in cases in which an asymmetric carbon arises due to substitution or branching, may be either one of optically active and a racemic mixture; ~~ring A and ring C each represent, independently, represents~~ any one of a trans-1,4-cyclohexylene group in which one CH₂ structure within said group or two or more non-adjacent CH₂ structures within said group may be replaced with -O- and/or -S-, a 1,4-phenylene group in which one CH structure within said group or two or more non-adjacent CH structures within said group may be replaced with -N=, a 1,4-cyclohexenylene group, a 1,4-bicyclo(2.2.2)octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a trans-decahydronaphthalene-trans-2,6-diyl group, and a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, and said groups may be substituted with either one of a cyano group and a halogen; ring B represents any

one of general formulas (I-1) to (I-4)



(wherein, X^1 , X^3 , X^4 , X^5 , X^6 , X^8 , X^9 and X^{10} each represent, independently, any one of a hydrogen atom, a chlorine atom and a fluorine atom, provided that conditions described below are satisfied:

a. in (I-1) and (I-2), in a case in which at least one of X^3 , X^4 , X^5 and X^6 represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^1 , X^8 , X^9 and X^{10} represents either one of a chlorine atom and a fluorine atom,

b. in (I-1) and (I-2), in a case in which at least one of X^1 , X^8 , X^9 and X^{10} represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^3 , X^4 , X^5 and X^6 represents either one of a chlorine atom and a fluorine atom, and

c. in (I-3) to (I-4), hydrogen atoms within a ring may be replaced with a cyano group or a halogen);

E^+ represents any one of CH_2CH_2 , $\text{C}\equiv\text{C}$, $(\text{CH}_2)_4$, $\text{CF}=\text{CF}$, OCH_2 , CH_2O , OCF_2 , CF_2O ,

U.S. Patent Application Serial No. 10/030,185

Amendment filed October 19, 2004

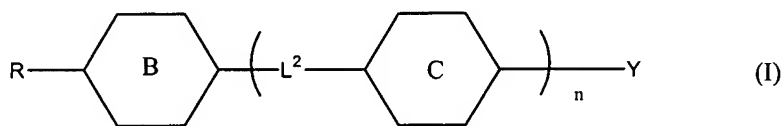
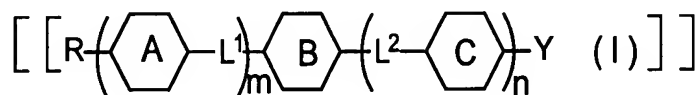
Reply to AA dated September 1, 2004 and

FOA dated May 19, 2004

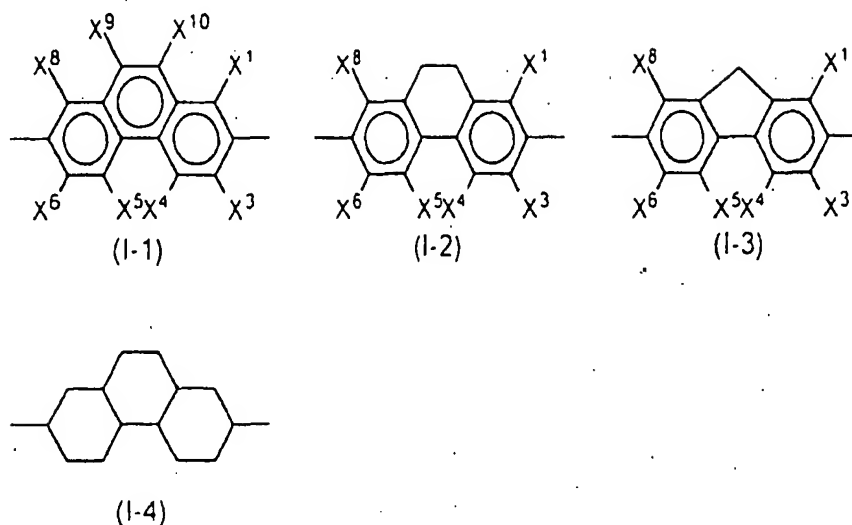
~~-CO₂-, -OCO-, -CH=N-N=CH-, -CH=CH-CH₂-CH₂-, -CH₂-CH₂-CH=CH-~~ and a single bond; L² represents a single bond, m represents 0, and n represents 1, then at least one of L¹ or L²[[,]] when present, represents a single bond; and Y represents a fluorine atom.

Claim 19 (currently amended): A fused ring compound represented by a general formula

(I)



(wherein, R represents an alkyl group or alkoxyl group of 1 to 16 carbon atoms, an alkenyl group of 2 to 16 carbon atoms, an alkenyloxy group of 3 to 16 carbon atoms, or an alkyl group of 1 to 12 carbon atoms substituted with an alkoxyl group of 1 to 10 carbon atoms, and said groups may be substituted with a halogen, and in cases in which an asymmetric carbon arises due to substitution or branching, may be either one of optically active and a racemic mixture; ~~ring A and ring C each represent, independently, represents~~ a trans-1,4-cyclohexylene group which may be substituted with a fluorine atom, or a 1,4-phenylene; and ring B represents any one of general formulas (I-1) to (I-4)



(wherein, X^1 , X^3 , X^4 , X^5 , X^6 , X^8 , X^9 and X^{10} each represent, independently, any one of a hydrogen atom, a chlorine atom and a fluorine atom, provided that conditions described below are satisfied:

a. in (I-1) and (I-2), in a case in which at least one of X^3 , X^4 , X^5 and X^6 represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^1 , X^8 , X^9 and X^{10} represents either one of a chlorine atom and a fluorine atom,

b. in (I-1) and (I-2), in a case in which at least one of X^1 , X^8 , X^9 and X^{10} represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^3 , X^4 , X^5 and X^6 represents either one of a chlorine atom and a fluorine atom, and

c. in (I-3) to (I-4), hydrogen atoms within a ring may be replaced with a halogen);

L^2 represents a single bond; ~~m represents 0~~ and n represents 1.